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REMARKS

Applicant submits a Petition and Fee for a One-Month Extension of Time.

Claims 1-6 and 10-21 are all the claims presently pending in the application. Claim 3 has been amended to more particularly define the invention. New claims 10-21 have been added. Previously withdrawn claims 7-9 have been canceled without prejudice or disclaimer. Applicant reserves the opportunity to file divisional applications on the non-elected subject matter.

It is noted that the claim amendments herein or later are not made to distinguish the invention over the prior art or narrow the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein or later should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

With respect to the prior art rejections, claims 2 and 5-6 stand rejected under 35 U.S.C. §102(e) as being anticipated by Arisaka. (U.S. Patent No. 6,578,833). Claim 3 stands rejected under 35 U.S.C. §102(b) as being anticipated by Seiichi. (U.S. Patent No. 5,333,845). Claims 1 and 4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bevins et al.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary aspect of the present invention, as recited in claim 1, is directed to a string type air damper including a cylinder formed in a tubular shape, defining a guide hole at

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one end portion thereof, a piston, which moves in the cylinder, a helical spring for biasing the piston toward the other end portion of the cylinder, and a string member guided from inside of the cylinder to outside thereof through the guide hole, wherein the piston and the string member are integrally formed, and a reinforcing plate including a material which is different than a material of the piston and string member, attached to the piston as a mount for receiving the helical spring.

Another aspect of the invention, as recited in claim 2, is directed to a string type air damper including a cylinder formed in a tubular shape, defining a guide hole at one end portion thereof, a piston, which moves in the cylinder, a helical spring for biasing the piston toward the other end portion of the cylinder, and a string member guided from inside of the cylinder to outside thereof through the guide hole. The piston and the string member are integrally formed, the string member branches into a plurality of portions and connects with the piston at a base end portion thereof, and the portions come together at a forward end portion of the string member.

Yet another aspect of the invention, as recited in claim 3, is directed to a string type air damper including a cylinder formed in a tubular shape, defining a guide hole at one end portion thereof, a piston, which moves in the cylinder, a helical spring for biasing the piston toward the other end portion of the cylinder, and a string member guided from inside of the cylinder to outside thereof through the guide hole. The piston and the string member are integrally formed, and the string member has a flat belt shape, the guide hole of the cylinder has a flat opening and a smooth arcuate face continuing to a wide width edge of the opening, and the string member having the belt shape is bent and guided along the arcuate face of the guide hole.

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A further aspect of the invention, as recited in claim 5, is direct to a string type air damper including a cylinder formed in a tubular shape, a piston, which moves in the cylinder, a helical spring for biasing the piston toward one end portion of the cylinder, a guide cap attached to the other end portion of the cylinder and defining a guide hole, and a string member guided from inside of the cylinder to outside thereof through the guide hole. The guide cap and the string member are formed integrally, and the string member is hooked to the piston within the cylinder and is guided to the outside thereof.

Conventional string type air dampers include a string member and piston formed separately from each other. A loop is generally formed at base end of the string member that is often accompanied by a complicated process. The piston in such conventional devices includes a hook to which the loop-shaped base end of the string member is hooked. However, the process of hooking the string member to the piston is complicated. (See Application at page 2, lines 21-25 and page 3, lines 1-3)

In the invention of independent claims 1, 2 and 3, on the other hand, the string member is formed integrally with the piston. Therefore, unlike the conventional string type air dampers, it is unnecessary to form a loop at the base end of the string member with the associated complicated work. Also, it is unnecessary to form a hook portion in the piston and to hook the loop-shaped base end of the string member at the hook of the guide cap. Accordingly, the string type air damper can be very easily assembled. (See Application at page 15, lines 11-19)

Claim 1 further provides a reinforcing plate attached to the piston that greatly facilitates assembly of the damper (Application at page 5, lines 1-9) and the reinforcing plate

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provides a surface upon which an end portion of the helical spring can be positively supported (Application at page 5, lines 17-21).

The invention of claim 2 further provides a piston and string member integrally formed and the string member branches into a plurality of portions connected to the piston at a base end portion thereof. These features, amongst others, provide an integrally formed piston and string member which, as noted above, greatly facilitates assembly of the damper (Application at page 5, lines 1-9) and a string member that branches into a plurality of portions in order to support the piston such that the piston can be stably moved within the cylinder (Application at page 6, lines 8-11).

Additionally, the invention of independent claim 3 provides an integrally formed piston and string member with a string member having a belt shape, and a guide hole of the cylinder having a flat opening and a smooth arcuate face upon which the string member having the belt shape can be bent and guided. These features, amongst others, provide an integrally formed piston and string member which, as noted above, greatly facilitates assembly of the damper (Application at page 5, lines 1-9) and a string member that has greater strength and is able to be flexibly bent and guided during operation of the damper (Application at page 12, lines 20-24).

Further, the invention of independent claim 5, provides a string member and a guide cap integrally molded and the forward end portion of the string member hooked to the piston and then introduced outside. Therefore, unlike the conventional string type air dampers, in which a loop is formed at the base end portion of the string member which is hooked at the hook portion of the piston and its complications, it is unnecessary to do the above

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complicated work in the present invention. Accordingly, the string type damper can be easily assembled. (See Application at page 5, lines 22-25 and page 6, lines 1-7)

A string type damper having the above features is not taught or suggested by the cited references.

II. THE PRIOR ART REFERENCES

A. The Arisaka Reference

The Examiner alleges that the invention of claims 2 and 5-6 are anticipated by Arisaka. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Arisaka discloses a pull-in device for a string including a tubular cylinder, a piston adapted to move inside the cylinder, and urging spring for elastically urging the piston inside the cylinder, and a string to be pulled in or pulled out with the movement of the cylinder.

(See Arisaka at Abstract)

However, Arisaka does not teach or suggest that “*the piston and the string member are integrally formed [and] the string member branches into a plurality of portions and connects with the piston at a base end portion thereof,*” as recited in claim 2. Nor does Arisaka teach or suggest that “*the guide cap and the string member are formed integrally,*” as recited in claim 5.

Instead, Arisaka discloses that “[t]he piston 2 is further provided on opposite sides across the center with two hooking parts 14 that are adapted to slidably hook the string 4.”

(Arisaka at column 4, lines 20-22) (Emphasis added) “[T]he string 4 is successively folded

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back at the intervening points thereof (i.e. in a back and forth fashion)” between the hooking parts 11,14 of the cap 6 and piston 2, respectively. One terminal part 4a of the string 4 is inserted through the through hole 12 of the cap 6 and led thereout, while the other terminal part 4b of the string 4 is hooked on one of the hooking parts 11 of the cap 6. (See Arisaka at column 4, lines 29-36) (Emphasis added)

Therefore, in Arisaka, “[o]ne terminal part of the string can be pulled out of the cylinder and meanwhile, the intervening points of the whole length of the string can be hooked serially on the hooking parts as folded back, and the other terminal part of the string can be fixed on the cylinder or piston.” (Arisaka at column 1, lines 60-64) Thus, there is no teaching or suggestion in Arisaka that the string and piston are integrally formed.

In fact, Arisaka actually teaches away from the string 4 being integrally formed with the piston 2 by indicating that the two hooking parts 14 of the piston 2 are adapted to slidably hook the string 4. (See Arisaka at column 4, lines 20-22) Clearly, Arisaka does not teach or suggest that the piston 2 and the string 4 are integrally formed, as in claim 2.

Further, there is no teaching or suggestion in Arisaka that the string branches into a plurality of portions, as in claim 2. As noted above, Arisaka merely discloses a single continuous string 4 that is sequentially hooked on the hooking parts 11,14 of the piston 2 and cap. Indeed, Arisaka teaches that the string 4 only has a two terminal parts 4a and 4b. Nowhere does Arisaka teach or suggest that the string 4 is branched in any manner in order to support the piston such that the piston can be stably moved within the cylinder.

In fact, Arisaka seeks to provide a string of “far greater length than the length of the cylinder” while miniaturizing the device. (See Arisaka at column 1, lines 64-67) As such, it

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would be contrary to the object of Arisaka to branch the string 4 in any manner. Clearly, Arisaka does not teach or suggest that the string 4 branches into a plurality of portions, as in claim 2.

Additionally, there is no teaching or suggestion in Arisaka that the guide cap and string member are integrally formed, as in claims 5 and 6. As noted above, Arisaka merely discloses that the other terminal part 4b of the string 4 is hooked on one of the hooking parts 11 of the cap 6. (See Arisaka at column 4, lines 35-36)

Further, similar to above, Arisaka actually teaches away from the string 4 being integrally formed with the cap 6 by indicating that the two hooking parts 11 of the cap 6 are adapted to slidably hook the string 4. (See Arisaka at column 4, lines 20-22) Clearly, Arisaka does not teach or suggest that the cap 6 and the string 4 are integrally formed in order to facilitate assembly of the damper, as in claims 5 and 6.

Therefore, Applicant submits that there are elements of the invention of claims 2 and 5-6 that are not taught or suggested by Arisaka, and the Examiner is respectfully requested to withdraw this rejection.

B. The Seiichi Reference

The Examiner alleges that the invention of claim 3 is anticipated by Seiichi. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Seiichi discloses an air cylinder damper device including a cylinder body having a front terminal opening, a piston slidably disposed inside the cylinder body, a spring member

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for biasing the piston in a shutting direction. (See Seiichi at Abstract)

However, Seiichi does not teach or suggest that “*the piston and the string member are integrally formed[,]* *the string member has a belt shape[, and]* *the guide hole has a flat opening and a smooth arcuate face continuing to a wide width edge of the opening,*” as recited in claim 3.

Rather, Seiichi discloses that “the piston 2 is integrally formed with a hook part 5 for hooking the one terminal part Sa of the string member S.” (See Seiichi at Figure 1 and column 3, lines 11-14) (Emphasis added) Seiichi alternatively discloses that “the one terminal part Sa of the string member S is connected to the piston through the coupling piece 14, adapted to retain a calked piece 13.” (See Seiichi at Figure 9 and column 5, lines 40-44) (Emphasis added)

Indeed, Seiichi makes no reference or suggestion that the string member S is integrally formed with the piston 2. Clearly, Seiichi does not teach or suggest that the piston 2 and the string 4 are integrally formed, as in claim 3.

Seiichi further does not teach or suggest that the string member has a belt shape, as in claim 3. Indeed, there is no reference or suggestion in Seiichi of the shape of the string member S. In fact, the only reference to the shape of the string member S made in Seiichi is in Figure 12, which shows a thread-like string member S. (See Seiichi at Figure 12)

Seiichi certainly makes no reference or suggestion to the desirability to incorporate a string member having a belt shape, or any shape for that matter, to an integrally formed piston and string member for the purpose of providing a stronger string member which is able to be

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flexibly bent and guided. Clearly, Seiichi does not teach or suggest that the string member has a belt shape, as in claim 3.

Additionally, Seiichi discloses that the guide face 6a “curves from a portion thereof having an annular surface that faces radially inwardly and extends substantially axially ... to a portion thereof that has an annular surface that faces substantially axially and extends substantially radially.” (See Seiichi at Figures 1 and 12 and column 3, lines 19-26)
(Emphasis added)

Clearly, in Seiichi, the guide face 6a extends between two annular surfaces and therefore defines a circular opening. In fact, Seiichi does not teach or suggest any other desirable shape for the opening. Clearly, Seiichi does not teach or suggest that the guide hole has a flat opening and a smooth arcuate face continuing to a wide width edge of the opening, as in claim 3.

Therefore, Applicant submits that there are elements of the invention of claim 3 that are not taught or suggested by Seiichi, and the Examiner is respectfully requested to withdraw this rejection.

C. The Bivens et al. Reference

The Examiner alleges that the invention of claims 1 and 4 is unpatentable over Bivens et al. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Bivens et al. discloses a plastic strand damper having a strand element that is integrally molded with the piston on one end and an attachment element on a second end

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(Bivens et al. at Abstract). The damper includes a coil spring wrapped around the strand element and abutting the piston and housing thereby urging the piston toward a retracted position (Bivens et al. at column 3, lines 6-10) within a cylindrical housing. The strand element reciprocatingly passes through a central aperture in the closed end of the upper housing (Bivens et al. at column 3, lines 13-15).

However, Bivens et al. does not teach or suggest that “*a reinforcing plate comprising a material which is different than a material of the piston and string member is attached to the piston to serve as a mount for receiving the helical spring*” as recited in claims 1 and 4. (Emphasis added)

The Examiner alleges the undefined aspect shown in the figures of Bivens et al. disposed between disc 16 and the first end 23 of the of the strand 24 teaches the reinforcing plate of claims 1 and 4. However, the undefined aspect is never referred to or described in the disclosure of Bivens et al. Bivens et al. certainly does not teach or suggest that the undefined aspect is a plate attached to the piston.

Bivens et al. actually discloses that “the piston 12, strand element 24 and disk-shaped attachment element 26 are integrally molded.” (See Bivens et al. at Figure 2 and column 2, lines 65-66) (Emphasis added) Therefore, not only is the undefined aspect an integral part of the piston, it is made of the same material. Clearly, there is no teaching or suggestion in Bivens et al. of a reinforcing plate attached to the piston, and more pointedly, to a plate formed of a material different than the piston, as in claims 1 and 4.

The Examiner concedes that there is no teaching or suggestion in Bivens et al. that the undefined aspect is formed of a material different than that of the piston, as recited in claims

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1 and 4. Rather, the Examiner alleges that “it would have been obvious to one having ordinary skill in the art at the time of applicant’s invention to modify the reinforcing plate to be constructed of a highly resilient material.”

However, as noted above, there is no mention in Bivens et al. of a reinforcing plate of any type attached to the piston or, more particularly, to such a plate formed of a material different than the piston, as in claims 1 and 4.

Notwithstanding, even assuming arguendo that the undefined aspect were made of a material different than the piston, as alleged by the Examiner, as noted above, the undefined aspect is an integral feature of the piston, and thus not a plate attached to the piston, as in claims 1 and 4. Indeed, Bivens et al. does not even recognize the desirability or benefit of providing a reinforcing plate attached to the piston.

In light of the above, Applicant submits that there are elements of the claims 1 and 4 that are not taught or suggested by Bivens et al. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. CONCLUSION

In view of the foregoing, Applicant submits that claims 1-6 and 10-21, all the claims presently pending in the application, are patentably distinct over the prior art of record and are allowable, and that the application is in condition for allowance. Such action would be appreciated.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number


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listed below to discuss any other changes deemed necessary for allowance in a telephonic or personal interview.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR §1.136. The Commissioner is authorized to charge any deficiency in fees, including extension of time fees, or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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